# Accelerating progress towards the United Nations' 90-90-90 target: The impact of a province-wide HIV Treatment-as-Prevention-based initiative in British Columbia, Canada

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## Introduction

"HIV **Treatment as Prevention**" (TasP), the scaling-up of testing followed by the immediate initiation of ART, is a strategy for reducing AIDS-related morbidity and mortality, and the spread of HIV. In British Columbia (BC), Canada, TasP was implemented under the Seek and Treat for Optimal Prevention of HIV/AIDS initiative **(STOP)** starting in 2010.

**Objective:** To compare the time from HIV diagnosis to antiretroviral therapy (ART) initiation **(time Dx-Tx)**, and from ART initiation to first virologic suppression **(time Tx-Vx)** before and after the implementation of STOP.

## Methods

**Design:** population-based retrospective cohort study

**Data:** longitudinal individual-level from STOP cohort

**Study population:** all diagnosed people living with HIV (PLWH) in BC, who were ≥18 years old, ART naïve, and newly diagnosed in BC between 2005 and 2016

**Outcomes:** time Dx-Tx & time Tx-Vx

**Exposures:** HIV diagnosis & ART initiation eras, each grouped into pre-STOP (2005-2009) and post-STOP (2010-2016)

**Statistical analysis:** negative binomial regressions modelled the effect of STOP on the time Dx-Tx and time Tx-Vx, adjusting for confounders
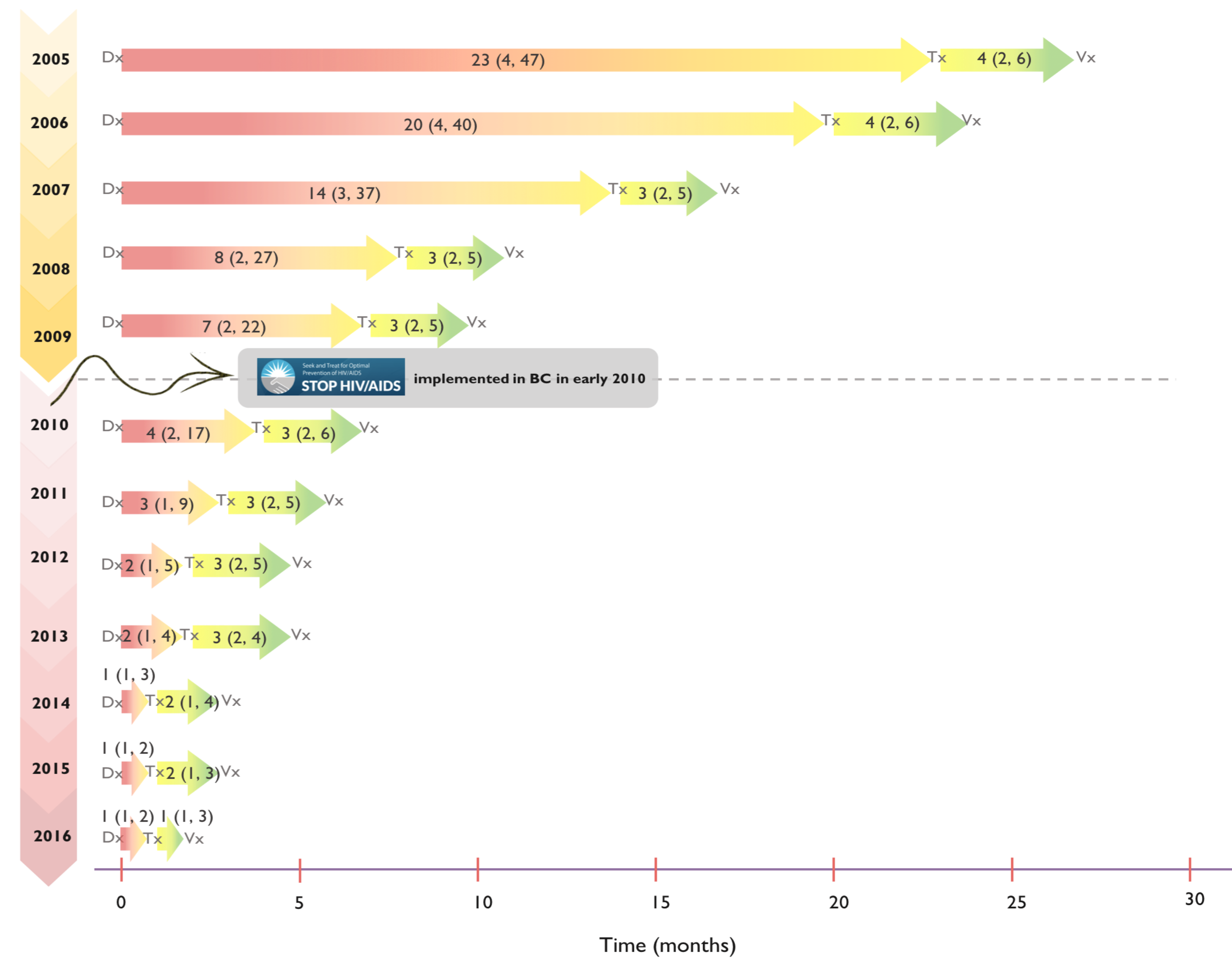


**Figure 1.** The distribution of time Dx-Tx and time Tx-Vx (in months) among PLWH in BC from 2005-2016

## Results

- PLWH diagnosed before (N=1601) and after STOP HIV/AIDS (N=1700) were significantly different, e.g., 30% vs. 15% ever injected drugs, and the median CD4 level at diagnosis 280 vs. 380 cells/µL
- From 2005 to 2016, median time Dx-Tx and time Tx-Vx **decreased substantially** (*Figure 1*)
- After STOP, time Dx-Tx decreased by as much as **22 months** among PLWH aged <30 years, but time Tx-Vx remained the longest among PLWH who live in **BC's most rural health authority** and had **history of injection drug use** (*Figure 2*)
- Controlling for confounders including **changes in ART eligibility and first-line ART preferences**, STOP was associated with a **65% shorter time Dx-Tx** (adjusted mean ratio: 0.35 [95%CI: 0.32-0.38]) and a **22% shorter time Tx-Vx** (0.78 [0.72-0.85])
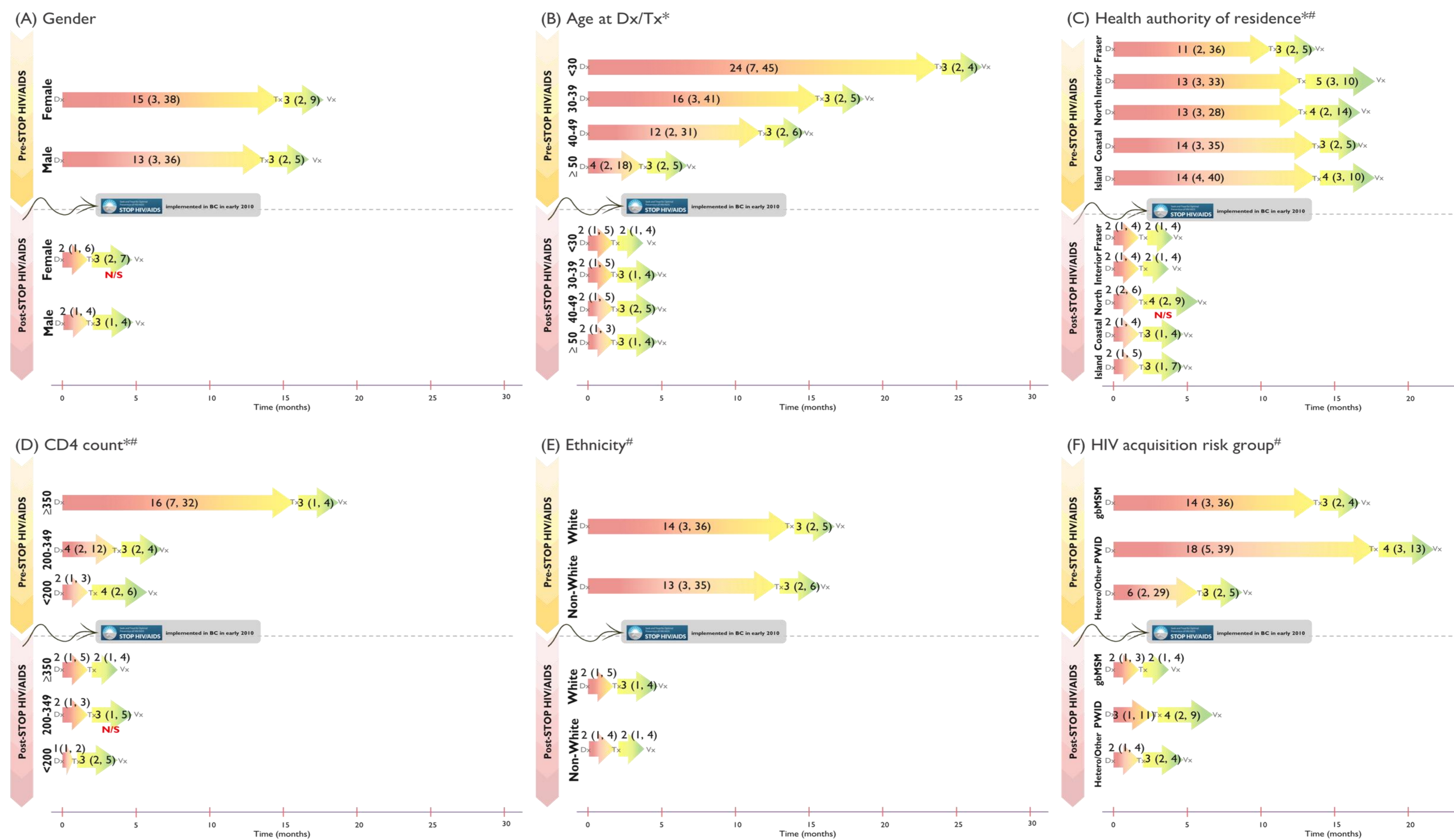
## Discussion

In our large population-based cohort with universal health coverage, a TasP-based intervention was significantly associated with early ART initiation and faster time to virologic suppression, thus **accelerating progress towards the United Nations' 90-90-90 target**.

Our results support the **global and equitable expansion of TasP** to accelerate the control of HIV/AIDS, as currently recommended by the United Nations.

**Figure 2.** The distribution of time from HIV diagnosis to ART initiation and from ART initiation to viral suppression (in months) before and after STOP HIV/AIDS roll-out, stratified by selected demographic and clinical characteristics

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